CLAIMS

1.   Method for managing resources in a communication system (10) having resources shared by at least two operators (12, 14), comprising the steps of:

receiving an access request for a first operator of the at least two operators (12, 14); and

executing a first determination whether there are sufficient amount of free resources available in the communication system (10),

characterised by the further steps of:

executing a second determination whether a total amount of resources in use in the communication system (10) exceeds a first threshold;

executing a third determination whether a total amount of resources in use for the first operator exceeds a second threshold; and

deciding on accepting the access request based on the results of the first, second and third determinations.

2.   Method according to claim 1, **characterised in that** the step of executing the second determination is performed only if the first determination shows that there are sufficient free resources available in the communication system (10).

3.   Method according to claim 1 or 2, **characterised in that** the access request is accepted if the second determination shows that the total amount of resources in use in the communication system (10) does not exceed the first threshold.

4.   Method according to claim 1 or 2, **characterised by** size discrimination based on the capacity requested by the incoming connection dependent on the total amount of resources in use in the communication system (10) if the second determination shows that the total amount of resources in use in the communication system (10) does not exceed the first threshold.

5.   Method according to claim 4, **characterised in that** the size discrimination comprises the steps of:

determination of a threshold class dependent on the total amount of resources in use in the communication system (10);

comparing an amount of resources required by the access request with a maximum accepted size (ξ_1, ξ_2, ξ_3) associated with the determined threshold class;

accepting the access request if the amount of resources (r_a-r_d) required by the access request is smaller than or equal to the maximum accepted size (ξ_1, ξ_2, ξ_3); and

rejecting the access request if the amount of resources (r_a-r_d) required by the access request is larger than the maximum accepted size (ξ_1, ξ_2, ξ_3).

6.   Method according to any of the claims 2 to 5, **characterised in that** the step of executing the third determination is performed only if the second determination shows that the total amount of resources in use in the communication system exceeds the first threshold.

7.   Method according to claim 6, **characterised in that** the access request is accepted if the third determination shows that the total amount of resources in use for the first operator does not exceed the second threshold.

8.   Method according to any of the claims 1 to 7, **characterised in that** the first threshold is equal to a pre-determined congestion threshold (β).

9.   Method according to any of the claims 1 to 7, **characterised in that** the first threshold is equal to a pre-determined congestion threshold (β) minus the amount of resources (r/C) required by the access request.

10.   Method according to any of the claims 1 to 9, **characterised in that** the second threshold is equal to a pre-determined portion of the total resources allocated to the first operator (p_1, p_2, p_3).

11.   Method according to any of the claims 1 to 9, **characterised in that** the second threshold is equal to a pre-determined portion of the total resources allocated to the first operator (p_1, p_2, p_3) minus the amount of resources (r/C) required by the access request.

12.   Method according to any of the claims 1 to 11, **characterised by** storing a respective measure (u_i) of the fraction of resources currently in use by each of said at least two operators (12, 14), said measure (u_i) for the first operator being updated upon accepting the access request or when an already established connection for the first operator is terminated.

13.   Method according to claim 12, **characterised by** updating the respective measures (u_i) by means of resource utilisation information from an external source.

14.   Method according to any of the claims 1 to 13, **characterised in that** the access request is rejected if the first determination shows that there are not sufficient free resources available in the communication system (10) or if the third determination shows that the total amount of resources in use for the first operator exceeds the second threshold.

15.   Method according to any of the claims 1 to 13, **characterised in that** a step of evaluating a priority of the access request if the first determination shows that there are not sufficient free resources available in the communication system (10) or if the third determination shows that the total amount of resources in use for the first operator exceeds the second threshold.

16.   Method according to claim 15, **characterised in that** the step of evaluating the priority comprises the steps of:
        executing a fourth determination whether the sum of the free resources available in the communication system (10) and a total amount of

resources being occupied by traffic having a lower priority than the priority of the access request for the first operator is smaller than the amount of resources required for the access request for the first operator;

rejecting the access request if the fourth determination shows that the sum of the free resources available in the communication system (10) and the total amount of resources being occupied by traffic having a lower priority than the priority of the access request for the first operator is smaller than the amount of resources required for the access request for the first operator; and

pre-empting on-going traffic sufficient to allow the access request for the first operator if the fourth determination shows that the sum of the free resources available in the communication system (10) and the total amount of resources being occupied by traffic having a lower priority than the priority of the access request for the first operator is equal to or larger than the amount of resources required for the access request for the first operator, and accepting the access request.

17.   Method according to claim 16, **characterised in that** the step of pre-empting in turn comprises the steps of:

determining which operator of the at least two operators (12, 14) presently being in most excess of its target resource utilisation;

selecting a connection of the operator of the at least two operators (12, 14) presently being in most excess of its target resource utilisation having a lower priority than the priority of the access request for the first operator;

releasing the selected connection;

determining whether the resources required for the access request is larger than the free resources available in the communication system (10); and

repeating the previous steps if the resources required for the access request is larger than the free resources available in the communication system (10).

18.   Method according to any of the claims 1 to 17, **characterised in that** the step of receiving an access request for the first operator in turn comprises the steps of:

receiving a renegotiation request for an ongoing call from the first operator;

providing a supplementary access request for the first operator having an access request size corresponding to the difference between a requested size and a present size of the ongoing call, if the requested size is larger than the present size; and

performing a change of resource utilisation for the ongoing call, if the present size is larger than the requested size.

19.   Arrangement being or comprising a device for managing resources in a communication system (10), the communication system (10) having resources shared by at least two operators (12, 14), the device comprising:

means for receiving an access request for a first operator of the at least two operators (12, 14); and

means for executing a first determination whether there are sufficient amount of free resources available in the communication system (10), **characterised by**:

means for executing a second determination whether a total amount of resources in use in the communication system (10) exceeds a first threshold;

means for executing a third determination whether a total amount of resources in use for the first operator exceeds a second threshold; and

means for deciding on accepting the access request based on the results of the first, second and third determinations.

20.   Arrangement according to claim 19, **characterised in that** the arrangement is a shared universal mobile telecommunication system terrestrial radio access network and the device is comprised in a radio network controller.

21.   Arrangement according to claim 19, **characterised in that** the arrangement is the communication system (10).